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AUTHOR Hornung, Owen J.; Morasky, Robert L.

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INSTITUTION State Univ. of New York, Plattsburgh. Coll. at

Plattsburgh.

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ABSTRACT

Based on the assumption that learning difficulty in programed instruction is related to completion time and program response error-rates, an attempt was made to demonstrate that deletion of knowledge of results (KR) and first example (E) in the Rule-Example-Positive/Negative Example teaching frame paradigm would increase learning difficulty. Four groups of 31 subsets each completed programs with the following designs: E and KR; E and no KR; KR and no E, and no E and no KR. Program response rates and work rates favored the inclusion of examples. KR influenced completion time when the examples were deleted. It was concluded that examples in teaching frames were a factor influencing learning difficulty. (Author)



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Owen J. Hornung & Robert L. Morasky, State University of New York

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Factors Influencing "Learning Difficulty" in Progressed Instruction

Owen J. Horning & Robert L. Horasby, State University of New York

The present study was based on the assumption that lastning difficulty is identify related to completion time and response error-rate in programmed materials. Furthermore, certain components in a teaching frame paradigm such as the Rule-Sample-Pos./Neg. Example frame could be removed and influence both the time and error-rate, thereby also influencing the program's level of learning difficulty. The first example in the Rule-Example-Pos./Neg., Example paradigm was hypothesisad to be a critical component which could influence level of learning difficulty. The question of whether or not knowledge of results would influence learning difficulty was also considered.

METHOD

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Four sets of programmed instructional meterials were devaloped, each differential on the basis of including or art including emeagles in the tecching distinct and the contract ensure as Enswicing of results. The basic format of the tecching distinct for Trograms One and Two consisted of a rule studentum fullowed by an emaple and a two-example, emiltiple-christs question. In Programs Taxes and Tour the tracing frames contained only the rule statement and the question. The delicities of the courples from Trograms Three and Tour resulted in a SIX madestion in the two bound numbers of words.

To addition, knowledge of neonite (M) was provided in Programs Can and Through with not in Programs Two and Tour. Therefore, this four programs were heldelied; Alapana Jan; Examples Anoviolge of recults (EKA), Program Two; Examples the Maccings of neonities (EKA), Program throwisings of neonities (EKA), Program throw; Hawwiedge of neonities—No Example (EKA), and income the program of the programs was an hypothetical tochnique for identifying and laballing parts of a finite,

The floor programs were remiculy distributed to the Sa at the beginning of a correctlembal session. Each 2 was given an ensure sheet on which to record the program and cumpletion time. Time was recorded to the named to propagate the contact to the named to the named to the canada to the canada to the contact to the contact to the canada to the program, eath 3 was given a 20 to the contact to the information. All test questions were making in the choice to the contact to the contact

Results and Conclusions

The program response means are shown in Table 1. The difference enough the groups was significant (FP9.71, df = 3.120, p < .01). Using paired comparisons, the program response means of Groups EED and EMME were each significantly granted than the NEWE and the NEWE Group means (p < .02).



The mean test scores for the four groups are shown in Table 1. The differences among the groups were not significant (F = .280, df = 3,120).

Completion time mean scores for the four groups are shown in Table 1. The differences among the groups were significant (F = 4.23, df = 3,120; p<.01). Paired comparisons revealed that only the completion time means of Groups KRNE and NEMKX were significantly different (p<.01).

Since Groups EKR and ENKR had approximately 31% more words than Groups KRMZ and MENKR, word per minute reading rates were calculated for each group and are shown in Table 1. The differences among the groups were significant (P=45.44, df=3,120; p<.01). The means of Groups KKR and ENKR were each eignificantly greater than the means of Groups KRNE and NENKR (p<.01).

Rate of Comprehension (RC) scores were computed for each S using the following formula: RC = the percent of the test item correct x the reading rate. The RC means for the four Groups are shown in Table 1. The differences among the groups were significant (F=25.83, df=3,120 p <.01). Paired comparisons showed the RC means of the EKR and the EMKR to be significantly greater than the corresponding means of the KRNE and the NENKR Groups (p <.01).

It was concluded that fewer errors would result while completing the program if examples were included in the teaching frames. Although there were no
apparent differences in completion times or test scores, differences did become
evident when work rates in the form of reading rate and rate of comprehension of
considered. Therefore, level of learning difficulty, as it relates to program
response error-rates and completion time, did increase if the first Example in
the Rule-Example-Pos./Neg. Example paradigm was deleted. Feedback or knowledge
of results had a positive effect on completion time only when no examples were
given.

Table 1

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Mean Program, Test, Time, Reading Rate and Rate of Comprehension (RC) Scores Find Example-Knowledge of Results (EKR), Example-No Knowledge of Results (ENKR), Brade ledge of Results - No Example (KRNE) and No Example - No Knowledge of Results (NENKR) Groups.

1	Groups			
Variables	EKR	ENKR	KRNE	NENKR
Program	15.06	15.50	14.43	13.96
Time	41.66	39.80	43.03	38.93
Test	12.66	13.13	12.60	13.20
Reading Rate	141.74	146.96	105.52	110.06
RC	91.88	93.69	62.66	70.91